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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/925,418	08/10/2001	Kazuhiro Shimizu	212706US2S	5716
22850	7590	10/17/2003	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			WEISS, HOWARD	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 10/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/925,418

Applicant(s)

SHIMIZU ET AL

Examiner

Howard Weiss

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 24 June 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 14-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-19 are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Attorney's Docket Number: 212706US2S  
Filing Date: 8/10/01  
Continuing Data: RCE established 6/24/03  
Claimed Foreign Priority Date: 8/11/00 (JPX)  
Applicant(s): Shimizu et al. (Arai)

Examiner: Howard Weiss

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/24/03 has been entered.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
  - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1 to 13 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohshima et al. (U.S. Patent No. 5,019,527) and Havemann (U.S. Patent No. 5,482,894).

Ohshima et al. show most aspects of the instant invention (e.g. Figures 8) including:

- a semiconductor body **1** of a first conductivity type and first **16** and second **14** semiconductor regions of a second conductivity type
- a gate stack with a gate insulating film **3**, a charge storage layer **4**, a control gate **6** and a cap insulating film **7** said stack having first and second side surfaces and a top surface
- an interlayer insulating film **21**, contact material **24** and a first insulating film **12** covering the second side surface and top surface but not the first side surface

Ohshima et al. does not disclose a second insulating film formed on said first side surface said contact material having a side surface in contact with the second insulating film and covering the entirety of the first insulating film, showing the second insulating film being nitride-based and explicitly showing the first insulating film being made of material different from the cap insulating film and the second insulating film being the same material of the cap.

Havemann teaches (Column 6 Lines 5 to 34) that the nitride-based insulating material is an equivalent structure known in the art. Therefore, because these two insulating films were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute nitride-based for oxide-based material. Additionally, Havemann teaches (e.g. Figures 2C and 2D) to form a second insulating film **42** on said first side surface and with contact material **40** having a side surface in contact with the second insulating film and covering the entirety of the first insulating film **30** to provide minimal protection during O<sub>2</sub> plasma etch (Column 5 Lines 16 to 31). It would have been obvious to a person of ordinary skill in the art at the time of invention to form a second insulating

film on said first side surface and with contact material having a side surface in contact with the second insulating film and covering the entirety of the first insulating film to provide minimal protection during O<sub>2</sub> plasma etch.

In reference to the claim language pertaining to the etch rate of the second insulating film (i.e. a nitride) being slower than the etch rate of the first insulating film (i.e. an oxide), the claiming of a new use, new function, or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and *In re Swinehart*, 439 F. 2d 210, 169 USPQ 226 (CCPA 1971); please see MPEP § 2112. Since Ohshima et al. and Havemann show all the features of the claimed invention, the etch rate of the second insulating film being slower than the etch rate of the first insulating film is an inherent property of Ohshima et al. and Havemann's invention.

Since the Applicant has not established the criticality of the thicknesses stated and since these thicknesses are in common use in similar devices in the art, it would have been obvious to one of ordinary skill in the art to use these values in the device of Ohshima et al. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

#### ***Response to Arguments***

4. Applicant's arguments filed 6/24/03 have been fully considered but they are not persuasive. The Applicants state that neither Ohshima et al. nor Havemann state anything about the etch rates of the various insulating layers. However, as pointed out in Paragraph 3 above, the express, implicit, and inherent disclosures of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. 102 or 103. "The inherent teaching of prior art reference, a question of fact, arises both in the context of anticipation and obviousness." *In re Napier*, 55 F.3d 610, 613, 34

*USPQ2d 1782, 1784 (Fed. Cir. 1995)* (affirmed a 35 U.S.C. 103 rejection based in part on inherent disclosure in one of the references). See also *In re Grasselli*, 713 F.2d 731, 739, 218 USPQ 769, 775 (Fed. Cir. 1983). The etch rates of silicon oxide and silicon nitride are well known in the art (e.g. see Wolf et al. 1986).

In reference to the rejection not addressing the problem confronted by the claimed invention, the mere fact that the references relied upon by the Examiner to evince an appreciation of the problem identified and solved by the instant invention is not, standing alone, conclusive evidence of the non-obviousness of the claimed subject matter. The references may suggest doing what an applicant has done even though those of ordinary skill in the art were ignorant of the existence of the problem. *In re Gershon*, 152 USPQ 602 (CCPA 1967).

In reference to Havemann's teachings of preferring oxide for the insulating layer, disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments. *In re Susi*, 440 F.2d 442, 169 USPQ 423 (CCPA 1971). "A known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use." *In re Gurley*, 27 F.3d 551, 554, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994).

In view of these reasons and those set forth in the present office action, the rejections of the stated claims stand.

### **Conclusion**

5. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. Papers should be faxed to Art Unit 2814 via the Art Unit 2814 Fax Center located in Crystal Plaza 4, room 3C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(703) 308-7722** or **-7724**. The Art

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Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications. The official TC2800 Before-Final, **(703) 872-9318**, and After-Final, **(703) 872-9319**, Fax numbers will provide the fax sender with an auto-reply fax verifying receipt of their fax by the USPTO.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(703) 308-4840** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via [Howard.Weiss@uspto.gov](mailto:Howard.Weiss@uspto.gov). Any inquiry of a general nature or relating to the status of this application should be directed to the Group 2800 Receptionist at **(703) 308-0956**

7. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/324, 390, 751, 760; 438/586	thru 10/1/03
Other Documentation: none	
Electronic Database(s): EAST	thru 10/1/03

HW/hw  
2 October 2003

Howard Weiss  
Examiner  
Art Unit 2814